

Project Monitoring And Control

A – Actual Cost (AC): The total cost incurred for work performed to date. Related terms: Planned Cost (PC), Earned Value (EV). Example: If a task budgeted at \$10,000 has incurred \$6,000, the AC is \$6,000. Challenge: Capturing all indirect costs accurately.

A – Activity: A discrete work element with defined start and finish dates. Related terms: Work Package, WBS Element. Example: "Install HVAC system" is an activity. Challenge: Ensuring activities are neither too large nor too small for effective monitoring.

A – Activity Duration Estimate: The forecasted time needed to complete an activity, often expressed as a range (optimistic, most likely, pessimistic). Related terms: PERT, Monte Carlo Simulation. Example: Using three-point estimating to derive a 10-day duration. Challenge: Accounting for resource availability fluctuations.

A – Activity List: A comprehensive inventory of all scheduled activities, including identifiers, descriptions, and logical relationships. Related terms: Activity Attributes, WBS Dictionary. Example: A spreadsheet listing 150 activities for a construction project. Challenge: Keeping the list synchronized with scope changes.

A – Activity On-Arrow (AOA) Diagram: A network diagram where activities are represented by arrows and dependencies by nodes. Related terms: Precedence Diagramming Method (PDM). Example: AOA diagram showing "Design" precedes "Procurement." Challenge: Managing complex interdependencies without clutter.

A – Actual Finish Date: The calendar date on which an activity truly completed. Related terms: Planned Finish Date, Schedule Variance. Example: An activity planned to finish on March 15 actually finished on March 20, indicating a delay. Challenge: Recording accurate finish dates in real time.

A – Actual Start Date: The calendar date when work on an activity actually began. Related terms: Planned Start Date, Start Variance. Example: A task scheduled for Jan 1 started on Jan 3 due to resource delay. Challenge: Aligning start dates with contractual milestones.

A – Agile Monitoring: Continuous observation of sprint progress using burndown charts, velocity, and cumulative flow diagrams. Related terms: Scrum, Kanban. Example: Tracking story points completed each sprint. Challenge: Integrating agile metrics with traditional Earned Value Management.

A – Baseline: The approved version of the project schedule, cost, or scope against which performance is measured. Related terms: Schedule Baseline, Cost Baseline, Scope Baseline. Example: A baseline schedule showing a 12-month duration. Challenge: Controlling baseline changes through formal change control.

A – Baseline Drift: The gradual shift of the baseline due to informal adjustments, often unnoticed until variance analysis. Related terms: Scope Creep, Schedule Slippage. Example: Small schedule tweaks adding

up to a three-month extension. Challenge: Maintaining baseline integrity.

B – Baseline Variance: The difference between actual performance and the baseline, expressed in time or cost units. Related terms: Schedule Variance (SV), Cost Variance (CV). Example: A cost variance of $-\$5,000$ indicates overruns. Challenge: Interpreting variance in multi-project environments.

B – Benchmarking: Comparing project performance metrics against industry standards or similar projects. Related terms: Best Practices, Performance Index. Example: Using Earned Schedule (ES) benchmarks to gauge schedule health. Challenge: Finding comparable data sets.

B – Buffer Management: The technique of allocating and tracking time buffers (e.g., Critical chain buffers) to protect the project schedule. Related terms: Critical Chain, Project Buffer. Example: Monitoring buffer consumption to predict delays. Challenge: Communicating buffer status to stakeholders unfamiliar with the concept.

C – Critical Path: The longest sequence of activities that determines the earliest possible project completion date. Related terms: Float, Critical Chain. Example: Activities A-B-C-D form the critical path; any delay on them delays the project. Challenge: Updating the critical path as activities finish early or late.

C – Critical Path Method (CPM): A scheduling technique that calculates earliest start/finish and latest start/finish dates to identify the critical path. Related terms: Forward Pass, Backward Pass. Example: Using CPM to derive a 24-month schedule. Challenge: Managing resource-leveling impacts on the critical path.

C – Critical Chain: A schedule-compression method that focuses on resource constraints and adds buffers to protect the chain of dependent tasks. Related terms: Buffer Management, Resource Leveling. Example: Adding a project buffer of 10% of total duration. Challenge: Convincing stakeholders to adopt buffer concepts over traditional slack.

C – Cost Performance Index (CPI): A ratio of earned value to actual cost (EV/AC). Related terms: Schedule Performance Index (SPI), Earned Value Management (EVM). Example: A CPI of 0.85 Signals cost inefficiency. Challenge: Interpreting CPI when scope changes occur.

C – Cost Variance (CV): The difference between earned value and actual cost ($EV - AC$). Related terms: Cost Performance Index, Budget at Completion (BAC). Example: $CV = \$200,000 - \$210,000 = -\$10,000$, indicating an overrun. Challenge: Distinguishing between variance caused by estimation error versus execution issues.

D – Daily Progress Report: A concise record of work accomplished, resources used, and issues encountered each day. Related terms: Status Update, Progress Log. Example: Reporting 5% of the foundation completed on Day 12. Challenge: Ensuring consistency and timeliness of daily entries.

D – Delay Analysis (also Schedule Impact Analysis): The systematic evaluation of the causes and effects of schedule delays. Related terms: Critical Path, Float. Example: Using “as-planned vs. As-built” comparison to quantify a two-week delay. Challenge: Isolating delay owners in complex, multi-contract environments.

D – Earned Value (EV): The budgeted cost of work actually performed to date. Related terms: Planned Value (PV), Actual Cost (AC). Example: If 40% of a $\$500,000$ scope is completed, $EV = \$200,000$. Challenge: Aligning

EV calculations with agile deliverables.

E – Earned Value Management (EVM): An integrated methodology that combines scope, schedule, and cost to assess project performance and forecast outcomes. Related terms: CPI, SPI, Variance Analysis. Example: Using EVM to predict a 15 % cost overrun at project mid-point. Challenge: Maintaining accurate data inputs for reliable forecasts.

E – Earned Schedule (ES): An extension of EVM that translates earned value into schedule time units, providing a more intuitive schedule performance indicator. Related terms: Schedule Variance (SV), SPI. Example: ES indicates the project is effectively 3 weeks behind schedule. Challenge: Communicating ES concepts to non-technical stakeholders.

E – Estimate at Completion (EAC): The forecasted total cost of the project when completed, based on current performance trends. Related terms: Budget at Completion (BAC), To-Complete Performance Index (TCPI). Example: $EAC = \$620,000$ for a project with a BAC of $\$600,000$. Challenge: Selecting the appropriate EAC formula when variances are irregular.

E – Estimate to Complete (ETC): The expected cost required to finish the remaining work. Related terms: EAC, AC. Example: If $AC = \$300,000$ and $EAC = \$620,000$, then $ETC = \$320,000$. Challenge: Adjusting ETC when scope changes occur mid-project.

F – Float (Slack): The amount of time an activity can be delayed without affecting the project's finish date. Related terms: Total Float, Free Float. Example: An activity with 5 days of total float can slip up to 5 days without delaying the overall project. Challenge: Managing float to protect critical path activities.

F – Forecasting: The process of predicting future project performance using trends, statistical models, or expert judgment. Related terms: Earned Value Forecasting, Monte Carlo Simulation. Example: Applying a linear regression to CPI trends to forecast final cost. Challenge: Accounting for uncertainty and external risk factors.

G – Gantt Chart: A visual timeline that displays activities, durations, start/finish dates, and dependencies. Related terms: Bar Chart, Schedule Baseline. Example: A Gantt chart showing overlapping design and procurement phases. Challenge: Maintaining clarity when the chart contains hundreds of activities.

H – Historical Data: Past project performance records used as reference for estimating and benchmarking. Related terms: Analogous Estimating, Lessons Learned. Example: Using previous construction cost data to refine current cost estimates. Challenge: Ensuring data relevance across differing project contexts.

I – Impacted Schedule: The revised schedule after incorporating delay events or scope changes. Related terms: As-Planned Schedule, Recovery Schedule. Example: Adding a 10-day buffer to recover from a material shortage. Challenge: Communicating schedule impacts to sponsors without causing alarm.

I – Integrated Change Control: The formal process for reviewing, approving, and documenting changes to the project baseline. Related terms: Change Request, Configuration Management. Example: A change control board (CCB) evaluates a request to add a new feature. Challenge: Balancing agility with control in

fast-moving environments.

I – Issue Log: A register of problems that arise during execution, including description, owner, and resolution status. Related terms: Risk Register, Action Item. Example: Logging a delayed permit as an issue with a target resolution date. Challenge: Prioritizing issues amid competing demands.

L – Lag: A deliberate delay between the finish of one activity and the start of its successor. Related terms: Lead, Dependency. Example: A 2-day lag between “Paint” and “Inspection” to allow drying. Challenge: Misusing lag can create unnecessary schedule extensions.

L – Lead: An overlap where a successor activity starts before its predecessor finishes. Related terms: Lag, Fast-Tracking. Example: Starting “Electrical Wiring” two days before “Wall Drywall” completes. Challenge: Managing the risk of rework when leads are applied.

M – Monte Carlo Simulation: A statistical technique that runs numerous schedule or cost scenarios to assess probability distributions of outcomes. Related terms: Risk Analysis, Sensitivity Analysis. Example: Simulating 10,000 schedule runs to estimate a 90% confidence completion date. Challenge: Interpreting wide probability ranges for decision-making.

M – Milestone: A significant project event or decision point with zero duration, used for tracking progress. Related terms: Deliverable, Phase Gate. Example: “Final Design Approval” as a milestone. Challenge: Defining milestones that provide genuine insight rather than arbitrary dates.

N – Network Diagram: A graphical representation of activities and their logical relationships, used for schedule analysis. Related terms: Precedence Diagramming Method (PDM), Critical Path. Example: A network diagram illustrating 25 activities with dependencies. Challenge: Updating the diagram efficiently after scope changes.

P – Performance Review: A periodic assessment of schedule and cost performance against baselines, often using EVM metrics. Related terms: Variance Analysis, Forecasting. Example: Monthly performance review revealing a CPI of 0.92. Challenge: Translating review findings into actionable corrective actions.

P – Planned Value (PV): The budgeted cost of work scheduled to be performed by a given date. Related terms: Earned Value, Schedule Baseline. Example: By week 8, PV = \$150,000. Challenge: Aligning PV with realistic progress when activities are lagging.

P – Progress Measurement Baseline (PMB): The integrated scope-schedule-cost baseline used for performance measurement. Related terms: Baseline, Earned Value Management. Example: PMB combines a WBS, 12-month schedule, and \$5 M budget. Challenge: Maintaining PMB integrity amid frequent change requests.

P – Project Charter: The formal document authorizing the project, outlining objectives, high-level scope, and authority. Related terms: Statement of Work (SOW), Business Case. Example: Charter grants the project manager authority to allocate resources. Challenge: Ensuring charter alignment with later detailed baselines.

P – Project Management Information System (PMIS): Software tools that collect, store, and disseminate

project data for monitoring and control. Related terms: Earned Value Software, Dashboard. Example: Using a cloud-based PMIS to generate live schedule variance reports. Challenge: Data integrity when multiple users update the system.

P – Project Schedule: The chronological arrangement of activities, resources, and milestones that defines how and when project work will be performed. Related terms: Critical Path, Gantt Chart. Example: A 24-month schedule with 180 activities. Challenge: Balancing detail with usability for stakeholders.

P – Project Schedule Risk: Potential events that could affect the timing of project activities. Related terms: Risk Register, Schedule Buffer. Example: Supplier lead-time uncertainty identified as a schedule risk. Challenge: Quantifying risk impact on the critical path.

P – Projected Completion Date (PCD): The anticipated date when the project will be finished, based on current performance trends. Related terms: Earned Schedule, Forecasting. Example: PCD shifts from Dec 2026 to Feb 2027 after a delay. Challenge: Communicating date shifts without eroding stakeholder confidence.

P – Progress Reporting: The regular communication of performance data, often including variance, forecasts, and issue status. Related terms: Status Report, Dashboard. Example: Weekly report summarizing EV, AC, and SPI. Challenge: Avoiding information overload while providing actionable insight.

R – Recovery Plan: A set of corrective actions designed to bring a lagging schedule back on track. Related terms: Schedule Compression, Fast-Tracking. Example: Adding overtime and resequencing tasks to recover two weeks. Challenge: Assessing the impact of recovery actions on cost and quality.

R – Resource Loading: The allocation of resources to activities over time, displayed in histograms or spreadsheets. Related terms: Resource Leveling, Resource Allocation. Example: Loading 10 engineers across overlapping design tasks. Challenge: Identifying overallocation early enough to avoid schedule impact.

R – Resource Leveling: Adjusting activity start/finish dates to resolve resource conflicts while preserving logical relationships. Related terms: Critical Path, Schedule Compression. Example: Shifting a non-critical activity by three days to eliminate overallocation. Challenge: Preventing unintended extensions of the critical path.

R – Resource Smoothing: Modifying activity dates within their float limits to achieve a more even resource usage without extending project duration. Related terms: Float, Resource Loading. Example: Distributing a peak demand for 5 electricians over two weeks. Challenge: Limited smoothing options when float is scarce.

S – Schedule Baseline: The approved version of the project schedule used for performance comparison. Related terms: Baseline, Variance Analysis. Example: Baseline shows a 30-month finish; actual schedule now projects 32 months. Challenge: Controlling baseline changes through change control.

S – Schedule Compression: Techniques such as crashing or fast-tracking applied to shorten the project duration. Related terms: Crashing, Fast-Tracking, Critical Chain. Example: Adding extra labor to critical tasks to reduce schedule by two weeks. Challenge: Managing the cost-time trade-off.

S – Schedule Variance (SV): The difference between earned value and planned value (EV – PV). Related terms: Cost Variance, Schedule Performance Index. Example: $SV = \$10,000 - \$12,000 = -\$2,000$, indicating the project is behind schedule. Challenge: Interpreting SV when the schedule includes many parallel paths.

S – Schedule Performance Index (SPI): A ratio of earned value to planned value (EV/PV). Related terms: Cost Performance Index, Earned Schedule. Example: SPI of 0.95 Shows the project is progressing at 95 % of the planned rate. Challenge: SPI becomes less meaningful when the project is near completion.

S – Scope Baseline: The approved version of the project scope statement, WBS, and WBS dictionary, forming the basis for scope verification. Related terms: Scope Creep, Change Control. Example: Scope baseline defines 25 deliverables. Challenge: Preventing undocumented additions that erode schedule predictability.

S – Scope Creep: Uncontrolled expansion of project scope without corresponding adjustments to schedule, cost, or resources. Related terms: Change Request, Baseline Drift. Example: Adding a new feature without revising the schedule. Challenge: Detecting early signs through variance trends.

S – Significant Milestone: A milestone that represents a major decision point or contractual deliverable, often tied to payment or acceptance. Related terms: Gate Review, Deliverable. Example: "System Acceptance" milestone triggers final payment. Challenge: Aligning milestone dates with realistic schedule forecasts.

S – Sensitivity Analysis: Examining how variations in input variables affect project outcomes, often used for risk assessment. Related terms: Monte Carlo Simulation, What-If Analysis. Example: Testing how a 10 % increase in labor rates impacts EAC. Challenge: Selecting the most influential variables for analysis.

T – Target Cost: The cost goal established for a project, often derived from the budget at completion. Related terms: Budget at Completion (BAC), Cost Baseline. Example: Target cost for Phase 1 is \$2 M. Challenge: Aligning target cost with realistic market rates.

T – Task Dependency: The logical relationship between two activities, such as finish-to-start, start-to-start, finish-to-finish, or start-to-finish. Related terms: Lag, Lead. Example: "Foundation" must finish before "Framing" can start (FS). Challenge: Managing complex dependency matrices.

T – To-Complete Performance Index (TCPI): The cost performance index required to meet a specified target (EAC or BAC). Related terms: CPI, EAC. Example: $TCPI = (\$600,000 - \$300,000) / (\$620,000 - \$300,000) \approx 0.96$. Challenge: Communicating the urgency implied by a $TCPI > 1.0$.

V – Variance Analysis: The systematic examination of differences between planned and actual performance, focusing on cost, schedule, and scope. Related terms: Earned Value, Root Cause Analysis. Example: Analyzing why CPI dropped from 0.98 To 0.85. Challenge: Distinguishing between systemic issues and isolated events.

V – Variance Threshold: Pre-defined limits that trigger corrective action when exceeded. Related terms: Control Limits, Management Reserve. Example: A schedule variance exceeding 10 % of total duration initiates a review. Challenge: Setting thresholds that are neither too sensitive nor too lax.

W – Work Breakdown Structure (WBS): A hierarchical decomposition of the total scope of work into manageable deliverables and work packages. Related terms: WBS Dictionary, Scope Baseline. Example: Level-1: Construction; Level-2: Foundations, Superstructure, Finishes. Challenge: Ensuring WBS aligns with schedule granularity.

W – Work Package: The lowest level of the WBS that can be scheduled, cost-estimated, and assigned to a responsible party. Related terms: Activity, WBS Dictionary. Example: “Install HVAC Ductwork” as a work package. Challenge: Defining packages small enough for accurate monitoring yet large enough to avoid excessive administrative burden.

W – Work Performance Data: Raw observations and measurements collected during execution, such as hours worked, material quantities, and percent complete. Related terms: Work Performance Information, Earned Value. Example: Recording 80 % completion for “Electrical Rough-in.” Challenge: Transforming data into reliable performance information promptly.